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Courier Press, Leamington Spa, England.

## Description

Technical field

This invention pertains to pavement markers used in delineating traffic lanes on highways.

Background

Historically, pavement markings have fallen into three basic classes:

(1) Painted lines having glass spheres embedded in a polymeric material to provide some degree of retroreflection;

(2) Preformed tapes comprised of polymeric film having an adhesive on one side and a layer of glass spheres on the other; and

(3) Raised pavement markers providing discrete points of a retroreflective material.

Raised pavement markers offer a greater degree of night delineation or retroreflection, wet or dry, than is offered by painted lines and tapes. Most commercial forms of raised lane delineators comprise a flat-bottomed disk or base (ceramic, polymeric or metal) having a raised portion which carries a reflector portion made of reflective glass microperes or cube-corner reflector inserts. After the passage of time, these devices can move or slide out of position under the repeated impact of vehicle wheels.

Raised markers or delineators have found wide application in road markings, but their application would be even wider except for some disadvantages, specifically: cost (more expensive than tape or reflective paint), poor durability (broken upon impact, scratched reflective surface, etc.) and placement, requiring curable adhesives (epoxy), holes or anchors to remain in place. In geographic areas in which roadways must be plowed to clear them of snow, such lane delineators are quickly removed by the plowing operation. Furthermore, raised markers made of a hard or heavy material could cause property damage and injury if they were thrown into the air by a snowplow, e.g., breaking a passing motorist's windshield.

Some known pavement markers have a raised rubber reflecting portion or tab which is intended to bend over under a vehicle tire. Others have a reflecting portion which is supposed to retract into a recess in the pavement. The former type is illustrated by U.S. Patents 4,111,581; 3,963,362; 3,879,148; and 3,785,719 corresponding to DE—U—7,136,160. In all of these patents, the reflecting portion is a flat reflectorized rubber piece or tab rising above the pavement surface. The tab is supported at its bottom by attachment to the base portion. These designs suffer from at least two disadvantages: a, fatigue at the joint between the reflecting tab and the base (causing the tab to fail to recover to its intended position or to simply lie flat); and b, creasing or breaking of the reflector due to the flexing of the tab at some point inbetween its top and the base. The forces exerted by a moving vehicle tire on a pavement marker are complex and change as the tire traverses the marker. Vertical tab markers actually tend to crimp or bend in the middle before bending near the base. Markers having reflecting surface tabs oriented at an obtuse angle to the road surface, tend to lose reflectivity rapidly due to the action of dirt and grit as tires pass over the reflector.

The object of this invention is a raised pavement marker offering a high degree of reflectivity, low cost, ease of placement with adequate durability, and safety while alleviating the support and creasing problems of primr raised rubber markers. Another object is to provide a preformed tape offering the same advantages of high reflectivity, low cost, and good durability.

Disclosure of invention

According to various aspects of the invention there is provided a pavement marker as defined in claims 1 and 5 respectively. By way of explanation, a compressive strength of a certain pressure at 25 percent compression means the pressure necessary to compress the material by 25%. Compressive strength is measured by ASTM test specification D1056. The compressive strength at 25% compression of the material used in an embodiment of the invention is at least 41 kPa.

It has been found that the use of a soft, easily compressed elastomer, preferably a sponge or cellular polymer (cellular rubber), as the body of the raised marker reduces the impact forces generated when the marker is struck by a vehicle tire. A retroreflective film may be applied to the foam to provide the desired reflective properties.

Pavement markers tested in reducing this invention to practice exhibited brightness far beyond conventional paints or tapes, and similar to that of known raised pavement markers. In addition, these markers reflected effectively both wet and dry.

These markers may also utilize pressure-sensitive adhesive on the bottom for adhering to the road surface, making their placement very easy by simply pressing them to the surface.

Several other advantages are realized over known raised markers:

(1) The marker bodies can be produced in continuous extruding equipment rather than in molds or by joining various components. The polymeric body is extruded and cut to the desired length. The pressure-sensitive adhesive and reflective sheeting can also be applied by continuous means.

(2) No recess or hole in the roadway is required, as is the case with many other types of pavement markers.

(3) Compression of the marker body material itself is a significant contributing factor to the deformation of the marker under the vehicle wheel, in addition to bending which seems to be the major mode of deformation in known deformable or retractable pavement markers. Solid rubber markers do not generally compress as well as cellular polymers.

Physically, all raised pavement markers (except those which retract into holes in the road) exert

sufficient force to actually raise the vehicles some finite height. The greater this height becomes, the more force is exerted upon the marker by each vehicle which is forced to deviate from its path. The use of cellular elastomers (sponge rubbers) for the body minimizes this force since they compress well. The uncompressed marker height is normally in the range of 5 mm to 25 mm, and is preferably not greater than 20 mm.

Reflective tapes for such purposes as lane delineation can take advantage of the same principle. That is, they can be made of slightly raised foam or cellular polymer which easily compresses under the weight of a vehicle tire. Preferably, the total thickness of the tape is up to about 2.5 mm maximum. With ordinary tapes, much of the frictional force from a vehicle tire are believed to be transmitted to the interface between the adhesive and the road. Known tapes can smear, break or slide under these forces, e.g. the shear stress created by a tire being turned on a tape. The cellular polymer would dampen these applied forces, reducing the effect on the adhesive interface. The tape could be produced by cutting a strip of foam polymer from a cylinder of such material and applying a reflective layer to the strip. The reflective (preferably retroreflective) layer could be applied by reverse roll coating polyurethane to the foam strip and next placing glass beads on the polyurethane while it is still wet. A pressure sensitive adhesive may be placed on the bottom surface for adhering to the road surface.

The type of raised pavement markers disclosed herein may be produced at very low cost, thereby allowing placement of a series of numerous markers so drivers would see a continuous stripe along the road. Where reflector height is 9.5 mm and viewing distance is about 61 meters the markers should be placed at about 760 mm intervals for reflecting from automobile headlights.

Brief description of drawing

Fig. 1 is a perspective view of one embodiment of the pavement markers of this invention,

Fig. 2 is an elevation view of the pavement marker of Fig. 1 in its compressed state as it would be under the load of a vehicle tire.

Fig. 3 is a perspective view of another embodiment of the pavement marker of this invention.

Fig. 4 is an elevation view of the pavement marker of Fig. 3 in its compressed state as it would be under the load of a vehicle tire, normally at least about 96 kPa.

Fig. 5 is a cross-section of the embodiment of these pavement markers called the protected diamond shape.

Detailed description of the invention

Fig. 1 shows the components of one embodiment of this invention. Item 2 is an elastomeric body, for example made of a sponge elastomer such as polyurethane, silicone rubber, ethylene propylene diene terpolymer (EPDM), neoprene or blends of EPDM and neoprene. Adhesive layer 3 is attached to the base of the body, and reflecting material 4 is attached to the raised reflecting surface portion 5 of the body. A surprisingly small amount of adhesive is necessary to hold these flexible foam markers on the road (e.g., peel strength of 4.2 pounds per inch, 0.74 kN/m). The angle θ between the reflecting surface and the base for between the reflecting surface and the road surface) is usually between 45 and 135°, preferably between 45 and 90°.

Reflecting portion 4 is preferably a thin retroreflective sheet comprising a polymeric support sheet in which a monolayer of transparent microspheres or beads are embedded to slightly more than half their diameter. The glass beads carry a coating of reflective material such as aluminum over their embedded surfaces. The reflector support sheet has a layer of adhesive on the back by which it is adhered to the pavement marker body as shown. For wet reflection, enclosed lens sheeting appears to perform best (i.e., glass beads covered by a clear polymer layer) although an exposed lens sheeting and cube corner reflectors may also be used.

Reinforcement may be used within the body (e.g., fiberglass fabric or fibers) to strengthen the markers.

As mentioned earlier, the pavement marker bodies of this invention can be made by an extrusion process. The manufacture of cellular or sponge rubbers in an extrusion process is known. The uncured elastomer is generally compounded with vulcanizing chemicals and a blowing agent at a temperature below the decomposition temperature of the blowing agent. A suitable EPDM sponge rubber is described in Borg, E. L., "Ethylene/Propylene Rubber", in *Rubber Technology*, 2d ed., Morton, M. ed., Van Nostrand Reinhold Company, New York, 1973, at pages 242 and 243. Further description of sponge rubber is found in Otterstedt, C. W., "Closed Cell Sponge Rubber", in *The Vanderbilt Rubber Handbook*, R. T. Vanderbilt Co., Inc., Norwalk, Conn., 1978, at pages 728—729.

The compound is extruded through a die of specified shape. The extrudate is then cured and simultaneously expanded at elevated temperature. Curing may be done in a brine bath at about 204°C.

After the body material extrudate has been cured, a reflective (preferably retroreflective) film is applied to the raised surface adapted to face oncoming traffic, generally by use of an adhesive such as a pressure sensitive adhesive. The retroreflective film is preferably of the type known as wide angle flat top sheet which comprises: a back reflector; an overlying transparent matrix; a light-returning layer of small transparent spheres embedded in the transparent matrix in optical connection with the back reflector but spaced from it a distance to increase substantially the brilliance of reflected light; and a transparent overlying solid covering and conforming to the front extremities of the spheres and having a flat

front face. Such sheeting reflects a cone of light back toward a light source, even though the incident beam strikes the reflector at an angle other than perpendicular to the sheeting. One patent on the subject of such sheeting is U.S. Patent 2,407,680. The transparent film occupying the space between the spheres and the reflector is called the spacing film. This wide angle flat top sheeting can be considered an embedded lens or enclosed lens sheeting having a spacing film or layer with a thickness which locates the back reflector at the approximate focal point of the optical system.

Wide angle flat top retroreflective sheeting may be made, for example, by a solution casting technique comprising the following process steps: (a) providing a paper carrier web coated with a release agent such as polyethylene; (b) coating the release agent side of the carrier web with a 25% solids solution of fully reacted aliphatic elastomeric polyurethane of the polyester type in an isopropanol, toluene, xylene solvent (e.g., QI3787 from K. J. Quinn Company in Malden, Massachusetts) in sufficient amount to yield about a 50 microns dry film thickness; (c) drying the coating from step (b) for example at about 93°C for 15 minutes; (d) applying a bead bond coat about 5 microns thick of the same polyurethane material used in step (b) to the dry coating from step (c) and contacting the wet polyurethane surface with glass microspheres (e.g., about 20 microns diameter and 2.26 refractive index); (e) drying the microsphere-coated web for example at 93°C for 5 minutes; (f) coating a spacing layer polymer of the same aliphatic elastomeric polyurethane composition onto the microsphere-covered web or sheet from step (e) to sufficient amount to yield a dry film thickness about equal to the focal length of the microspheres; (g) drying the sheeting from step (f); (h) vapor coating the spacing layer with a specularly reflective material (e.g., aluminum); (i) removing the paper carrier web; and (j) coating the back side of the reflective material with an acrylate-base pressure-sensitive adhesive having a silicone-coated release liner.

A polyurethane hard coating may be applied to the front surface of the sheeting to reduce the accumulation of dirt on the sheeting in use. Such a hard coating has a generally tack-free surface and substantially higher 100% modulus of elasticity and lower ultimate elongation than the polyurethane used for the transparent matrix in the reflective sheeting. A typical suitable hard coat polymer is K. J. Quinn QI3515 having a 100% modulus of 5840 psi (40.2 MPa) and 210% ultimate elongation, fully reacted aliphatic elastomeric polyurethane of the polyester type.

The polyurethane polymers used for the transparent matrix and spacing layers are useful because they are somewhat elastic and can follow the movement of the pavement marker body without delaminating.

Finally, an adhesive is applied to the bottom surface of the marker body. Preferably, it is a phenolic modified polybutadiene pressure sensitive adhesive at least about 250 microns thick cast on a disposable (paper) liner. The liner is removed prior to placement of the marker on the road surface.

The markers may be applied to the road by at least two methods. One such method is removing the adhesive liner and pressing the marker to the road surface or onto other marking materials (tape or paint). A second method comprises applying the markers to a tape which is thereafter applied to the road.

Hollow cross-section markers may help to dissipate the heat of compression better than solid foam, and they may compress better, offering less resistance to vehicles travelling over them.

It has been found that design of the shape of the marker contributes to an extension of durability and prolonging reflectivity. The shape of the marker in Fig. 1 also does not have the potential water entrapment problem of the D cross-section.

To increase durability, marker shapes of this invention provide some form of lateral or back support for the reflector, unlike the markers with raised reflective rubber tabs discussed in the background section. The body has a connecting portion which joins the base and the back side of the raised surface which it supports. For example, the marker of Fig. 1 supports the whole back of the reflector 4 with raised body portion 5. The reflecting portion is not simply a thin pliable tab in the roadway, as with the older designs.

In the embodiment of Fig. 3, the connecting portion forms an acute angle with the plane of the bottom of the base portion and has two ribs located on the back side of said connecting portion oriented parallel to the plane of the base. More than two such ribs can be used.

An alternative embodiment of the invention, shown in Fig. 5, comprises an elastomeric body with the compressive strength and base as described above but having:

(a) a portion with a diamond-shaped cross-section oriented such that at least one of its surfaces is a raised surface adapted to face oncoming traffic when the marker is mounted on a road, to which raised surface is attached a reflective material; and

(b) at least one protective rib 20 and 22 forming a part of the base, which rib together with the rest of the base defines a depression into which the diamond-shaped portion is folded approximately flat under the load of a vehicle wheel (usually at least about 96 kPa), the top of the diamond-shaped portion being about as high as or lower than the top of the protective rib when under such load.

The marker should be placed so that there is set at least one protective rib located in front of raised surface adapted to face oncoming traffic. The height of the protective rib is generally a minimum of 45% of the height of the diamond-shaped portion, as measured from the bottom of the base. However, it should not be so high as to obscure the reflecting material. The ribs are

believed to protect the diamond-shaped portion from stress concentration which would hasten its deterioration. Thus the protected diamond shape should have a longer service life.

As mentioned in the background section, there is also a tendency of flat reflectors to flex in the middle under vehicle loading. Certain design factors shown in the drawings are helpful in avoiding this tendency and cause the reflecting surface of the inventive marker to lie flat or approximately parallel to the base under a load of at least about 100 kPa as shown in Figs. 2 and 4 (protecting them from scuffing in the case of the designs shown in Figs. 1, 2, 3, and 4). Some of these features are: a, the rounding of corners, and b, relief cuts shown, such as that labelled number 6 in Fig. 1 and those labelled number 7 in Fig. 3. The base in the Fig. 1 and Fig. 3 markers extends to a position rearward of the raised surface 4, and the body extends from said rearward position to the back of the raised surface through its connecting portion.

The characteristic of lying flat under a load is obtained using the sponge rubbers described previously. It can also be attained by using normal vulcanized rubbers in a hollow configuration.

In the case of the protected diamond design of Fig. 5, the hollow diamond-shaped portion is joined to the base along the line defined by one of the corners of the diamond shape and is oriented so that at least one of its surfaces is a raised surface adapted to face oncoming traffic. In that embodiment the reflecting layer is adhered to at least one such surface. With this shape, the back of the reflecting surface is inherently supported at the top and bottom by the portions of the diamond that connect to it at an angle. The two protective ribs running parallel to and on opposite sides of the elongated sides of the diamond extend the life of the marker over that of similar designs without the ribs. The aspect ratios (width at the widest point divided by height) for the diamond shape and the ribs are preferably in the ranges of 0.6 to 1.0 and about 1 to 1.3 respectively. Height of the diamond shape is measured from the point where it joins the base, and height of the ribs is measured from the bottom of the marker.

Other embodiments of this invention will be apparent to those skilled in the art from a consideration of this specification or practice of the invention disclosed herein. Various omissions, modifications and changes to the principles described herein may be made by one skilled in the art without departing from the true scope and spirit of the invention which is indicated by the following claims.

**Claims**

1. A pavement marker for delineating traffic lanes on roadways comprising a body (2) made of an elastomer and having a base which can be attached to a roadway, a raised surface adapted to face oncoming traffic when the marker is mounted on a roadway, and a reflective material (4) attached to said raised surface, said pavement marker being characterized in that:

A) the elastomer has a compressive strength at 25 percent compression or less than about 100 kPa;

B) the body has a shape which supports the back of the raised surface by means of a connecting portion which extends between the back of the raised surface and the base and forms an actue angle with the plane of the bottom of the base; and

C) the raised surface lies flat and face down under a load of at least 96 kPa protecting the reflecting surface from scuffing.

2. The pavement marker of Claim 1 wherein the elastomer of Part (A) is a cellular elastomer.

3. The pavement marker of Claim 1 on which the body (2) has a relief cut (6) below the raised surface.

4. The pavement marker of Claim 1 having at least two ribs located on the back side of the connecting portion which ribs are oriented parallel to the plane of the base portion.

5. A pavement marker for delineating traffic lanes on roadways comprising a body (2) made of an elastomer and having a base which can be attached to a roadway, a raised surface adapted to face oncoming traffic when the marker is mounted on a roadway, and a reflective material (4) attached to said raised surface, said pavement marker being characterized in that:

A) the elastomer is a cellular elastomer having a compressive strength at 25 percent compression of less than about 100 kPa;

B) a portion of the body (2) has a diamond-shaped cross section which is oriented such that:

(i) at least one of its surfaces provides the raised surface, and

(ii) it is joined to the base along a line defined by one of the corners of the diamond shape; and

C) there is at least one protective rib (20) forming a part of the base which rib together with the rest of the base defines a depression into which the diamond-shaped portion is folded approximatley flat under the load of vehicle wheel, the top of the diamond-shaped portion being about as high as or lower than the top of the protective rib when under such a load.

6. The pavement marker of Claim 5 in which the height of the protective rib (20) of part (C) is at least 45% of the height of the diamond-shaped portion but not so great as to obscure the reflecting material.

7. The pavement marker of Claim 6 in which the rib (20) has an aspect ratio in the range of about 1 to 1.3, aspect ratio being defined as the ratio of the width at its widest point to the height of the rib.

8. A pavement marker as claimed in any preceding claim wherein the reflective material (4) of the raised surface comprises a back reflector, an overlying transparent matrix, a light-returning layer of small transparent spheres embedded in the transparent matrix in optical connection with

the back reflector but spaced from it a distance to increase substantially the brilliance of reflected light, and a transparent overlying solid covering and conforming to the front extremities of the spheres and having a flat front face.

9. A pavement marker as claimed in any preceding claim which is in the form of a tape having an adhesive layer for adhering it to the road surface.

10. A pavement marker as claimed in claim 9 wherein said adhesive is a pressure-sensitive adhesive.

11. A pavement marker as claimed in claim 8 wherein said transparent matrix is composed of an elastic polymer.

12. A pavement marker as claimed in any of claims 2, 5, 6 and 7, or as claimed in any of claims 8 to 11 as dependent upon any of claims 2, 5, 6 and 7 wherein the cellular elastomer is polyurethane, silicone rubber, neoprene rubber, ethylene propylene diene terpolymer (EPDM) or a blend of neoprene and EPDM.

**Patentansprüche**

1. Fahrbahnmarkierung zum Begrenzen von Fahrspuren auf Fahrbahnen mit einem aus einem Elastomer bestehenden Körper (2), der einen Basisteil besitzt, der auf einer Fahrbahn befestigbar ist, sowie eine erhabene Fläche, die bei auf einer Fahrbahn befestigten Markierung dem herankommenden Verkehr zugekehrt sein kann, und mit einer reflektierenden Einrichtung (4), die an der erhabenen Fläche angebracht ist, dadurch gekennzeichnet, daß

(A) das Elastomer bei einer Kompression von 25% eine Druckfestigkeit von weniger als etwa 100 kPa hat,

(B) der Körper eine solche Form hat, daß er die erhabene Fläche auf ihrer Rückseite mit einem Verbindungsteil abstützt, der sich zwischen der Rückseite der erhabenen Fläche und dem Basisteil erstreckt und unter einem spitzen Winkel zu der Ebene der Unterseite des Basisteils angeordnet ist, und

(C) die erhabene Fläche unter einer Last von mindestens 96 kPa flach liegt und abwärtsgekehrt und dadurch vor einem Abscheuern geschützt ist.

2. Fahrbahnmarkierung nach Anspruch 1, dadurch gekennzeichnet, daß das Elastomer gemäß Teil (A) ein zelliges Elastomer ist.

3. Fahrbahnmarkierung nach Anspruch 1, dadurch gekennzeichnet, daß der Körper (2) unterhalb der erhabenen Fläche eine Vertiefung (6) besitzt.

4. Fahrbahnmarkierung nach Anspruch 1, dadurch gekennzeichnet, daß auf der Rückseite des Verbindungsteils mindestens zwei Rippen angeordnet sind, die zu der Ebene des Basisteils parallel sind.

5. Fahrbahnmarkierung zum Begrenzen von Fahrspuren auf Fahrbahnen mit einem aus einem Elastomer bestehenden Körper (2), der einen Basisteil besitzt, der auf einer Fahrbahn befestigbar ist, sowie eine erhabene Fläche, die bei auf einer Fahrbahn befestigten Markierung dem herankommenden Verkehr zugekehrt sein kann, und mit einer reflektierenden Einrichtung (4), die an der erhabenen Fläche angebracht ist, dadurch gekennzeichnet, daß

(A) das Elatomer ein zelliges Elastomer ist, das bei einer Kompression von 25% eine Druckfestigkeit unter etwa 100 kPa hat,

(B) ein Teil des Körpers (2) einen rhombusförmigen Querschnitt hat und so orientiert ist, daß

(i) mindestens eine seiner Flächen die erhabene Fläche bildet und

(ii) der mimt dem Basisteil längs einer Linie verbunden ist, die von einer der Ecken des Rhombus bestimmt ist, und

(C) mindestens eine Schutzrippe (20) vorgesehen ist, die einen Teil des Basisteils bildet und zusammen mit dem übrigen Basisteil eine Vertiefung bildet, in die der rhombusförmige Teil unter der Belastung durch ein Fahrzeugrad annähernd flach hineingeklappt wird, wobei unter dieser Belastung der obere Rand des rhombusförmigen Teils ungefähr auf dem Niveau oder unter dem Niveau des oberen Randes der Schutzrippe angeordnet ist.

6. Fahrbahnmarkierung nach Anspruch 5, dadurch gekennzeichnet, daß die Höhe der Schutzrippe (20) gemäß Teil (C) mindestens 45% der Höhe des rhombusförmigen Teils beträgt, aber nicht so groß ist, daß die Rippe die reflektierende Einrichtung abdeckt.

7. Fahrbahnmarkierung nach Anspruch 6, dadurch gekennzeichnet, daß die Rippe (20) ein Abmessungsverhältnis von etwa 1 bis 1,3 hat, wobei das Abmessungsverhältnis das Verhältnis der Breite der Rippe an ihrer breitesten Stelle zu ihrer Höhe ist.

8. Fahrbahnmarkierung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die reflektierende Einrichtung (4) der erhabenen Fläche einen hinten angeordneten Reflektor, eine darüberliegende, durchsichtige Einbettungsmasse, eine in der durchsichtigen Einbeitungsmasse eingebettete, aus kleinen durchsichtigen Kugeln bestehende, lichtzurückwerfende Schicht, die mit dem hinten angeordneten Reflektor in optischer Verbindung steht, aber in einem so großen Abstand von ihr angeordnet ist, daß die Helligkeit des reflektierten Lichtes beträchtlich erhöht wird, und eine darüberliegende, durchsichtige, massive Abdeckung besitzt, die den vordersten Teilen der Kugeln angepaßt ist und eine ebene Vorderfläche hat.

9. Fahrbahnmarkierung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß sie ein Band bildet, das eine Klebstoffschicht zum Ankleben auf der Fahrbahnoberfläche besitzt.

10. Fahrbahnmarkierung nach Anspruch 9, dadurch gekennzeichnet, daß der Klebstoff ein Haftkleber ist.

11. Fahrbahnmarkierung nach Anspruch 8, dadurch gekennzeichnet, daß die durchsichtige Einbettungsmasse ein elastisches Polymer ist.

12. Fahrbahnmarkierung nach einem der Ansprüche 2, 5, 6 und 7 oder einem der Ansprü-

che 8 bis 11 in Rückbeziehung auf einen der Ansprüche 2, 5, 6, und 7, dadurch gekennzeichnet, daß das zellige Elatomer aus Polyurethan, Siliconkautschuk, Neoprenkautschuk, Ethylen-Propylen-Dien-Terpolymer (EPDM) oder einem Gemisch von Neopren und EPDM ist.

**Revendications**

1. Marque de chaussée pour délimiter des voies de trafic sur des routes, comprenant un corps (2) fabriqué en élastomère et comportant une base qui peut être fixée à une route, une surface surélevée ou redressée qui fait face au trafic incident lorsque la marque est montée sur une route, et une matière réfléchissante (4) fixée à ladite surface redressée, ladite marque de chaussée étant caractérisée en ce que:

(A) l'élastomère possède une résistance de compression, à 25% de compression, inférieure à 100 kPa environ:

(B) le corps a une configuration qui supporte le dos de la surface redressée au moyen d'une partie de liaison qui s'étend entre le dos de la surface redressée et la base et qui définit un angle aigu avec le plan de la surface inférieure de la base; et

(C) la surface redressée se couche à plat et la face vers le bas, sous une charge d'au moins 96 kPa, ce qui protège la surface réfléchissante d'une usure par frottement.

2. Marque de chaussée suivant la revendication 1, dans laquelle l'élastomère du paragraphe (A) est un élastomère cellulaire.

3. Marque de chaussée suivant la revendication 1, sur laquelle le corps (2) comporte une découpe de dégagement (6) au-dessous de la surface redressée.

4. Marque de chaussée suivant la revendication 1, comportant au moins deux nervures situées sur la face arrière de la partie de liaison, ces nervures étant parallèles au plan de la partie de base.

5. Marque de chaussée pour délimiter les voies de circulation sur des routes, comprenant un corps (2) fabriqué en un élastomère et comportant une base qui peut être fixée à une route, une surface redressée qui fait face au trafic incident lorsque la marque est montée sur une route, et une matière réfléchissante (4) fixée à ladite surface redressée, ladite marque de chaussée étant caractérisée en ce que:

(A) l'élastomère est un élastomère cellulaire ayant une résistance de compression, à 25% de compression, inférieure à 100 kPa environ;

(B) une partie du corps (2) a une section transversale en forme de losange qui est orientée de sorte que:

i) au moins une de ses surfaces constitue la surface redressée, et

ii) elle est reliée à la base le long d'une ligne définie par un des angles du losange; et

(C) il est prévu au moins une saillie de protection (20) faisant partie de la base, cette saillie définissant avec le reste de la base un creux dans lequel la partie de losange se plie sensiblement à plat sous in charge d'une roue de véhicule, le sommet de la partie on losange étant sensiblement aussi haut ou plus bas que le sommet de la saillie de protection lorsque cette partie est placée sous une tolle charge.

6. Marque de chaussée suivant la revendication 5, dans laquelle lu hauteur de la saillie de protection (20) du paragraphe (C) est au moins de 45% de la hauteur de la partie en losange, mais non suffisante pour occulter la matière réfléchissante.

7. Marque de chaussée suivant la revendication 6, dans laquelle la saillie (20) à un allongement dans la plage de 1 à 1,3 environ, l'allongement étant défini comme le rapport de la largeur, à son point le plus large, à la hauteur de la saillie.

8. Marque de chaussée suivant l'une quelconque des revendications précédentes, dans lequelle la matière réfléchissante (4) de la surface redressée comprend un réflecteur arrière, une matrice transparente superposée, une couche de renvoi de la lumière constituée de petites sphères transparentes noyées dans la matrice transparente en relation optique avec le réflecteur arrière mais espacée de celui-ci d'une certaine distance de manière à augmenter sensiblement la brillance de la lumière réfléchie, et un revêtement continu superposé transparent qui se conforme aux extrémités avant des sphères et présente une face avant plane.

9. Marque de chaussée suivant l'une quelconque des revendications précédentes, qui est sous la forme d'une bande comportant une couche adhésive pour son collage à la surface de la route.

10. Marque de chaussée suivant la revendication 9, dans laquelle ledit adhésif est un adhésif sensible à la pression.

11. Marque de chaussée suivant la revendication 8, dans laquelle ladite matrice transparente est composée d'un polymère élastique.

12. Marque de chaussée suivant l'une quelconque des revendications 2, 5, 6 et 7, ou suivant l'une quelconque des revendications 8 à 11 en ce qu'elles dépendent de l'une quelconque des revendications 2, 5, 6 et 7, dans laquelle l'élastomère cellulaire est un polyuréthane, un caoutchouc de silicone, un caoutchouc néoprène, un terpolymère éthylène-propylène-diène (EPDM), ou un mélange de néoprène et EPDM.

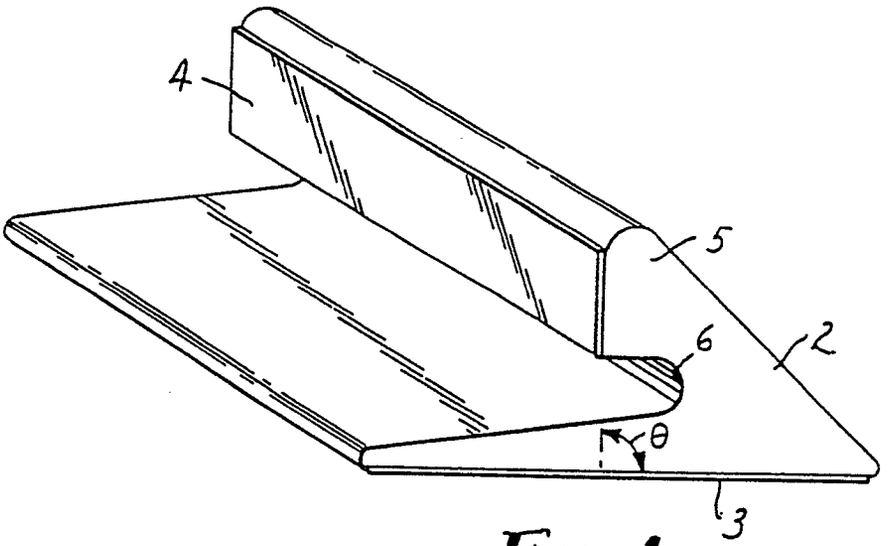



FIG.1

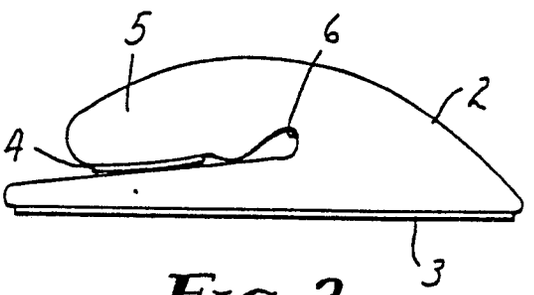



FIG.2

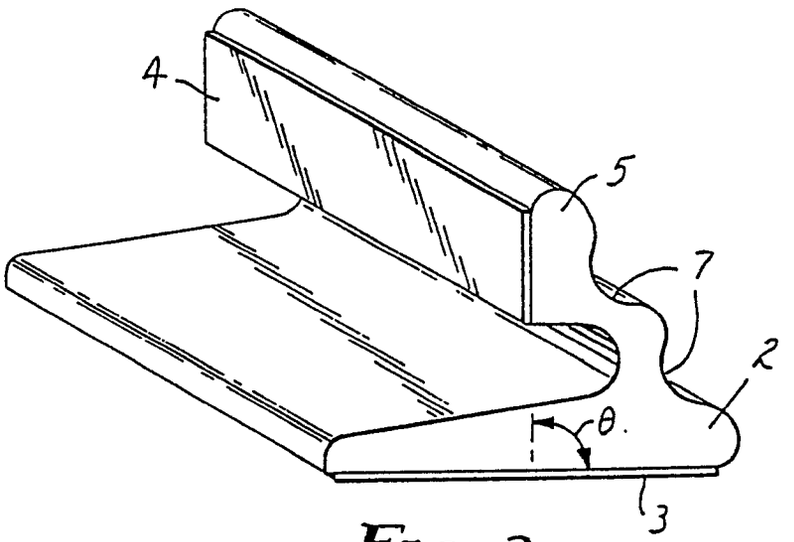



FIG.3




FIG.4

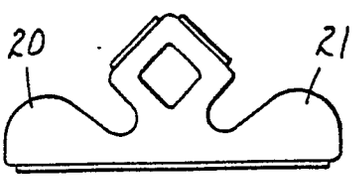



FIG.5